



Critical Care Therapy and Respiratory Care Section

Category:	Clinical
Section:	Airway Management
Title:	Extubation Procedure
Policy #:	02
Revised:	07/00

1.0. DESCRIPTION

1.1. Definition: Extubation is described as the discontinuation of an artificial airway.

1.2 Objective

- 1.2.1 The decision to extubate is made when an artificial airway is no longer needed because the indications for its original placement no longer exist, i.e.:
- 1.2.1.1 Obstruction
 - 1.2.1.2 Protection of airway
 - 1.2.1.3 Suctioning
 - 1.2.1.4 Ventilatory failure
 - 1.2.1.5 Hypoxemia

1.3 Indications

- 1.3.1 The discontinuation of the airway is often based on the assessment of pulmonary mechanics. Guidelines of adequate pulmonary mechanical function include:
- 1.3.1.1 Respiratory rate less than 25 breaths per minute
 - 1.3.1.2 Spontaneous tidal volume greater than 5 ml/kg
 - 1.3.1.3 Inspiratory force of at least -20 cm H₂O
 - 1.3.1.4 Vital capacity at least 10 ml/kg
- 1.3.2 The patient has sustained arterial blood gas values which have demonstrated a consistent PaO₂ greater than 60 mm Hg with an FiO₂ of less than 0.5; a PaCO₂ in the “normal” range for that patient; and a pH greater than 7.35.
- 1.3.3 The patient has demonstrated cardiovascular stability.

- 1.3.4 The patient has demonstrated an appropriate mental status and ability to protect his/her airway.

1.4 Precautions

- 1.4.1 Extubation should take place during a period of the day when adequate physician, nursing and therapist staffs are readily available.
- 1.4.2 Monitoring and continuous evaluation of the patient are necessary as well as the presence of skilled personnel who can reintubate the patient is necessary.
- 1.4.3 Prior to extubation, all of the equipment necessary for reintubation should be available at the bedside in case of acute decompensation.
- 1.4.4 Racemic epinephrine should be available for aerosolization in case of acute airway edema after extubation.

1.5 Adverse Reactions and Interventions

- 1.5.1 If the patient appears not to have tolerated extubation by clinical assessment (i.e., marked increase in the use of accessory muscles at respiration, increased heart rate, increased respiratory rate, cyanosis, etc.) or by deterioration of blood gases (increased PaCO₂ and decreased pH and PaO₂), notify the physician immediately so that the physician may assess the need for reintubation.
- 1.5.2 If the patient develops stridor immediately after extubation, notify the physician and obtain an order for aerosolized racemic epinephrine if appropriate.

2.0 EQUIPMENT AND MATERIALS

2.1 Intubation Equipment (these items are contained in the bedside intubation boxes):

- 2.1.1 Laryngoscope and blades (appropriate size for patient)
- 2.1.2 Proper size endotracheal tubes (include a smaller endotracheal tube than previously in place due to the possibility of laryngeal/tracheal edema)
- 2.1.3 20 ml syringe
- 2.1.4 Tape or tube fixation device

- 2.1.5 Stylet
- 2.1.6 Xylocaine jelly
- 2.1.7 Forceps
- 2.2 Scissors
- 2.3 Sterile gloves (2)
- 2.4 Suction
 - 2.4.1 Canister
 - 2.4.2 Vacuum with regulator
- 2.5 Suction catheters
- 2.6 Manual resuscitator and appropriately sized mask
- 2.7 Oxygen to be administered post extubation via mask/nebulizer system
- 2.8 Racemic epinephrine

3.0 PROCEDURE

- 3.1 There should be communication between therapist, nursing and physician staff in order to plan an appropriate time for extubation:
 - 3.1.1 In optimal situations, two individuals will extubate the patient-one with sterile gloves suctioning the patient and the second person hyperventilating the patient and removing the endotracheal tube.
- 3.2 Assemble the equipment listed in Equipment/Materials.
- 3.3 Explain the procedure to the patient.
- 3.4 Place the patient in intermediate or high Fowler's position.
- 3.5 Wash hands thoroughly and don gloves and mask.
- 3.6 Prepare equipment:
 - 3.6.1 Adjust the vacuum pressure so that it is appropriate for the patient.

- 3.6.2 Select the appropriate suction catheter size for the patient's airway.
- 3.6.3 Obtain sterile gloves, syringe, and scissors.
- 3.7 Hyperoxygenate the patient with 100% O₂ prior to extubation.
- 3.8 Remove tape or Tube Fixation System (TFS) which secures the endotracheal tube.
- 3.9 Suction the endotracheal tube adequately with pre and post hyperoxygenation and then suction the pharynx above the endotracheal tube cuff.
- 3.10 Insert a new catheter into the trachea via the endotracheal tube and instruct the patient to breathe slowly and deeply.
- 3.11 Deflate the cuff or cut the pilot balloon.
- 3.12 Ask the patient to take a deep breath and to cough, apply vacuum, and at the peak of inspiratory effort, rapidly remove the tube.
- 3.13 Administer humidified oxygen therapy.
- 3.14 Continue to evaluate the patient post extubation for signs of respiratory compromise.

4.0 POST PROCEDURE

- 4.1 Continuously assess the patient to verify the patient's comfort and ease of breathing. Assess adequate gas exchange by performing an arterial blood gas analysis at appropriate intervals following extubation.
- 4.2 Initiate a program of good bronchial hygiene, i.e., incentive spirometry, cough and deep breathing exercises and patient mobilization, to be performed in conjunction with the nursing staff.

5.0 CHARTING

- 5.1 Document the suctioning and extubation procedures on the "Comments" side of the "Continuous Ventilation Record" and on the patient's Daily Sheet, in the 10D MICU. In the 2J SICU, document this procedure both on the "Continuous Ventilation Record", and in the MIS. Remember to record the ventilator hours and patient information in the Ventilator Tracking Log book.

SIGNATURE: _____
Assistant Section Chief, CCTRCS, CCMD

DATE: _____

SIGNATURE: _____
Section Chief, CCTRCS, CCMD

DATE: _____

SIGNATURE: _____
Medical Director, CCTRCS, CCMD

DATE: _____

(Orig. 10/13/86)
(Rev. 11/89, 12/91, 8/94, 7/00)